# UNITED STATES PATENT AND TRADEMARK OFFICE

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| 09/830,790 | 07/13/2001 | Yilian Yuan | 32717-PCTUSA | 3697 |

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| ART UNIT | PAPER NUMBER |
|---|---|
| 3622 | |

DATE MAILED: 09/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

| | Application No. | Applicant(s) |
|---|---|---|
| **Office Action Summary** | 09/830,790 | YUAN, YILIAN |
| | Examiner | Art Unit | |
| | Nicholas Kim | 3622 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1) ☒ Responsive to communication(s) filed on *13 December 2004*.

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4) ☒ Claim(s) *1-17* is/are pending in the application.

　　4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1-17* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9) ☒ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on *13 July 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

　　Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

　　Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

　　a)☐ All   b)☐ Some * c)☐ None of:

　　　1.☐ Certified copies of the priority documents have been received.

　　　2.☐ Certified copies of the priority documents have been received in Application No. _____.

　　　3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

　　* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

## DETAILED ACTION

### *Information Disclosure Statement*

1.      The information disclosure statement filed August 23, 2001, fails to comply with

37 C.F.R. 1.98(a)(2), which requires the submission of each non-patent literature

publication or that portion which caused it to be listed. Applicant's letter accompanying

the IDS explains the absence of listed references by noting that copies of the Box et al.

(Box, G. E. P. and G. M. Jenkins, "Time Series Analysis: Forecasting, and Control," San

Francisco, Holden-Day, Inc., 1976, herein "Box 1976") and W. H. Greene (W. H.

Greene, "Econometric Analysis," Prentice-Hall, Inc., 1997) books are not readily

available. Accordingly, the IDS filed August 23, 2001, has been placed in the application

file, but certain information referred to therein (specifically, the contents of both Box

1976 and W. H. Greene) has not been considered.


2.      Applicant and the assignee of this application are required under 37 C.F.R. 1.105

to provide the following information that the examiner has determined is reasonably

necessary to the examination of this application.

3.      Beyond Applicant's own statement of materiality, a review of Applicant's

disclosed invention and a search of submitted and available prior art highlights the

critical nature of the two omitted references to Applicant's invention with respect to

enablement, novelty, and non-obviousness. For example, the original application makes

reference to Box 1976 and W. H. Greene, either directly or indirectly, to describe at least

Steps 240, 310 - 360, and 260 in the specification. Moreover, Box 1976 (or an earlier

edition) is described by other references as disclosing an iterative approach of building a

stochastic model including steps of identification (tentative model specification), fitting,

and diagnostic checking, a teaching clearly material to Applicant's claimed method and

system (Box, G. E. P. and G. C. Tiao, "Intervention Analysis with Applications to

Economic and Environmental Problems," Journal of the American Statistical

Association, Mar 1975, Vol. 70, Is. 349, 70-79, herein "Box 1975," at p. 70, Col. 2, ℓ. 13

– p. 71, Col. 1, ℓ. 4, herein "Box 1975"). Upon a review of the prior art including

references teaching intervention analysis, an extension of Box-Jenkins transfer analysis,

Box 1976 also appears material to Steps 250 and 410-420. Consequently, although

neither Box 1976 nor W. H. Greene were readily available when the IDS was filed, the

record strongly suggests that the Applicant nevertheless has access to information

necessary for a more complete understanding of the invention and its context. MPEP at

§704.10.

4.      In response to this requirement, please provide a copy of Box 1976 and W. H.

Greene.

5.      In responding to this requirement, where the document is a bound text or a single

article over 50 pages, the requirement may be met by providing copies of those pages that

provide the particular subject matter indicated in the requirement, or where such subject

matter is not indicated, the subject matter found in applicant's disclosure.

6.      This requirement is an attachment of the enclosed Office Action. A complete

reply to the enclosed Office Action must include a complete reply to this requirement.

The time period for reply to this requirement coincides with the time period for reply to

the enclosed Office Action.

## *Specification*

7.      The disclosure is objected to because of several informalities: at page 1, line 25,

"adverting" should be "advertising"; at page 2, line 1, "have different" should be "have a

different"; at page 2, line 12, "a vegetable" should be "vegetable"; at page 4, line 26, "as

exemplary" should be "an exemplary"; at page 6, line 6, "an univariate" should be "a

univariate"; and at page 8, line 29, "compared" should be "compared to".

Appropriate correction is required.

## *Claim Objections*

8.      Claims 1, 6, 8-9, 11-13, 16, and 17 are objected to because of the following

informalities:  at Claim 1, line 6, "detected; generating" should be "detected, generating";

at Claim 6, line 4, "detected; generating" should be "detected, generating"; at Claim 8,

line 13, "form which best fits" should be "forms which best fit"; at Claim 9, line 3,

"verses" should be "versus"; at Claim 11, line 11, "relationships" should be

"relationship"; at Claim 12, line 2, "relationships" should be "relationship"; at Claim 13,

line 4, "relationships" should be "relationship"; at Claim 16, line 20, "form" should be

"forms"; and at Claim 17, line 3, "verses" should be "versus".  Appropriate correction is

required.

## *Claim Rejections - 35 USC § 101*

9.      35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of
> matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the
> conditions and requirements of this title.

10.     Claims 1-17 are rejected under 35 U.S.C. 101 because the claimed invention lacks

patentable utility.  In particular, Claims 1-17 fail to meet the requirements of 35 U.S.C.

101 with regard to pertinence to the technological arts and production of a useful,

concrete, and tangible result.

11.     As an initial matter, the United States Constitution under Art. I, §8, cl. 8 gave

Congress the power to "[p]romote the progress of science and useful arts, by securing for

limited times to authors and inventors the exclusive right to their respective writings and

discoveries."  In carrying out this power, Congress authorized under 35 U.S.C. 101 a

grant of a patent to "[w]hoever invents or discovers any new and useful process, machine,

manufacture, or composition or matter, or any new and useful improvement thereof."

Therefore, a fundamental premise is that a patent is a statutorily created vehicle for

Congress to confer an exclusive right to the inventors for "inventions" that promote the

progress of "science and the useful arts."  The phrase "technological arts" has been

created and used by the courts to offer another view of the term "useful arts."  In re

Musgrave, 167 USPQ (BNA) 280 (CCPA 1970).  Hence, the first test of whether an

invention is eligible for a patent is to determine if the invention is within the

"technological arts."

12.     Further, despite the express language of 35 U.S.C. 101, several judicially created

exceptions have been established excluding certain subject matter as being patentable

subject matter covered by 35 U.S.C. 101.  These exceptions include "laws of nature,"

"natural phenomena," and "abstract ideas."  Diamond v. Diehr, 450, U.S. 175, 185, 209

USPQ (BNA) 1, 7 (1981), referred to herein as "Diehr."  However, courts have found

that even if an invention incorporates abstract ideas, such as mathematical algorithms, the

invention may nevertheless be statutory subject matter if the invention as a whole

produces a "useful, concrete and tangible result." State Street Bank & Trust Co. v.

Signature Financial Group, Inc. 149 F.3d 1368, 1973, 47 USPQ2d (BNA) 1596 (Fed. Cir.

1998), referred to herein as "State Street" [Referring to In re Alappat, 31 USPQ2d (BNA)

1557 (Fed. Cir. 1994)].

13.     This "two prong" test was evident when the Court of Customs and Patent Appeals

(CCPA) decided an appeal from the Board of Patent Appeals and Interferences (BPAI).

In re Toma, 197 USPQ (BNA) 852 (CCPA 1978), referred to herein as "Toma." In

Toma, the court held that the recited mathematical algorithm did not render the claim as a

whole non-statutory using the Freeman-Walter-Abele test as applied to Gottschalk v.

Benson, 409 U.S. 63, 175 USPQ (BNA) 673 (1972).  Additionally, the court decided

separately on the issue of the "technological arts."  The court developed a "technological

arts" analysis:

> The "technological" or "useful" arts inquiry must focus on whether the claimed subject
>
> matter...is statutory, not on whether the product of the claimed subject matter...is
>
> statutory, not on whether the prior art which the claimed subject matter purports to
>
> replace...is statutory, and not on whether the claimed subject matter is presently perceived
>
> to be an improvement over the prior art, e.g., whether it "enhances" the operation of a
>
> machine.  Toma at 857.

14.     In Toma, the claimed invention was a computer program for translating a source

human language (e.g., Russian) into a target human language (e.g., English).  The court

found that the claimed computer implemented process was within the "technological arts"

because the claimed invention was an operation being performed by a computer within a

computer.

15.     The decision in <u>State Street</u> never addressed this prong of the test. In <u>State Street</u>,

the court found that the "mathematical exception" using the Freeman-Walter-Abele test

has little, if any, application to determining the presence of statutory subject matter but

rather, statutory subject matter should be based on whether the operation produces a

"useful, concrete and tangible result." <u>State Street</u> at 1374. Furthermore, the court found

that there was no "business method exception" since the court decisions that purported to

create such exceptions were based on novelty or lack of enablement issues and not on

statutory grounds. Therefore, the court held that "[w]hether the patent's claims are too

broad to be patentable is not to be judged under §101, but rather under §§102, 103 and

112." <u>State Street</u> at 1377. Both of these analyses go towards whether the claimed

invention is non-statutory because of the presence of an abstract idea. Indeed, <u>State</u>

<u>Street</u> abolished the Freeman-Walter-Abele test used in <u>Toma</u>. However, State Street

never addressed the second part of the analysis, i.e., the "technological arts" test

established in <u>Toma</u> because the invention in <u>State Street</u> (i.e., a computerized system for

determining the year-end income, expense, and capital gain or loss for the portfolio) was

already determined to be within the technological arts under the <u>Toma</u> test. This

dichotomy has been recently acknowledged by the Board of Patent Appeals and

Interferences (BPAI) in affirming a 35 U.S.C. 101 rejection finding the claimed invention

to be non-statutory. <u>Ex parte Bowman</u>, 61 USPQ2d (BNA) 1669 (BPAI 2001).

16.     Applicant's Claims 1-10 are directed to an empirical statistical method employing

Box-Jenkins transfer function analysis of time-series data to model an effect of a

promotion on product performance while accounting for a market event. Applicant

explicitly admits that each of the steps described within the application (and thereby

providing support for the claims) can be performed either manually (e.g. by a human

research analyst) or on a computer (see Applicant's specification at p. 5, lines 9-11).

However, Claims 1-10 fail to positively recite any limitation pertaining to the

technological arts.

17.     Similar to Claims 1-10, Claims 11-17 fail to positively recite any limitation

pertaining to the technological arts. Drafted to invoke means-plus-function interpretation

under 35 U.S.C. 112, sixth paragraph, these Claims are directed to a system to be

implemented by either a human ("manually") or a computer, and equivalents thereof.

Interpreting the claims in the broadest reasonable sense, Claims 11-17 thus cover subject

matter incompatible with the statutory provisions of 35 U.S.C. 101 (i.e. a human as part

of the system structure). MPEP at §2105. It is noted that the alternative interpretation

(i.e. a computer and equivalents thereof) of Claims 11-17 are addressed in this Action at

Paragraph 93. Therefore, taking into account the present judicial interpretation of 35

U.S.C. 101 with regard to the technological arts and Applicant's own disclosure,

Applicant's Claims 1-10 are rejected as lacking pertinence to the technological arts, and

Claims 11-17 are also rejected (under one of two interpretations) as lacking pertinence to

the technological arts and directed to unpatentable subject matter.


18.     Additionally, Applicant's Claims 1-17 are further rejected under 35 U.S.C. 101 as

failing to satisfy the "useful, concrete, and tangible result" criteria outlined in State

Street. In particular, a review of Applicant's disclosure supports the assertion that the

invention defined by Claims 1-7 fails to produce a concrete and tangible result, and the

invention defined by Claims 8-17 fails to produce a concrete result.

19.     Concerning the issue of concreteness, Applicant's Claim 1 recites, inter alia, the

steps of determining a market event, examining the market event, determining a

relationship between a promotion and a product, detecting a lag structure, selecting a

functional form, evaluating the selected functional form, and quantifying a relationship

between the promotion and product performance. System Claim 11 recites substantially

similar limitations. These claim limitations are supported in the specification by

discussion regarding Steps 210-270, 310-360, and 410-420.

20.     As described above at Paragraph 16, Applicant states that all disclosed steps can

be performed manually or using a computer. However, several of the steps in

Applicant's lone explicitly disclosed embodiment require subjective decisions on the part

of a human research analyst. For instance, the step of determining a market event ("Step

210") is described only in terms of manual identification (see Applicant's specification at

p. 5, ℓ. 19-20), corresponding to the step of determining a market event recited in Claims

1 and 5. Such manual identification is highly subjective, as the outcome of this step (and

consequently, all steps afterward according to Figure 2) depends not only on the skill of

the research analyst, but also on the investigative interest/goal and mood of this analyst.

Further, not all market events can be consistently specified within a given econometric

model, demonstrated by the continuing application of new models to new market-related

phenomena in the literature. In particular, it is unclear whether the Box-Jenkins transfer

function approach relied upon by Applicant is compatible with certain market events

correlated to the explanatory variables in the lagged model (Edlund, Per-Olov,

"Identification of the Multi-input Box-Jenkins Transfer Function Model," Journal of

Forecasting, Jul-Sept 1984, Vol. 3, No. 3, 297-308, at p. 297, ℓ. 9-13). Moreover,

Applicant's method distinguishes between only two particular effects of a market event at

Steps 410 and 420. In the event the market event identified in Step 210 does not produce

such readily distinguishable results (for instance, if such impact were obscured by

another market event or exogenous trend), Applicant's method would fail to be operable.

21.     Several other steps also require subjective decisions to be made and have no

associated teaching of an algorithmic or computer implementation of such steps. These

steps include Steps 230-270 as described and recited at least at lines 8-19 of Claim 1. For

example, the step of determining a relationship ("Step 230") relies upon a research

analyst to specify the initial model structure (Applicant's specification at p. 5, ℓ. 30) with

no suggestion on how to distinguish among "model fitting information," "reasonableness

of coefficients," and "model robustness," subjective criteria in themselves. Although

suggestion is made that multiple model forms should be tried by an analyst (effectively

performing Applicant's entire method multiple times), such a limitation is neither

reflected in the claims nor the Figures. Regardless of the inclusion of iterations,

Applicant's method and results would vary significantly and depend on the subjective

judgments of a research analyst at several steps of Applicant's method. If the iterations

of the method are necessary for the claimed invention to be operative, then the pending

Claims require amendment to positively recite this critical element. MPEP at §2172.01.

22.     More generally, results or interpretation of results from empirical methods can

vary dramatically given certain model choices and subjective interpretations made along

the way. For example, the outcome and interpretation of a study by R. P. Leone differs

substantially from those of Wichern and Jones due to a different choice of intervention

(impulse vs. step) in modeling the impact of the American Dental Association's

endorsement of Crest dental cream (see Leone, Robert P., "Forecasting the Effect of an

Environmental Change on Market Performance: An Intervention Time-series Approach,"

International Journal of Forecasting, 1987, Vol. 3, 463-478, herein "Leone 1987" at p.

471, ℓ. 3 – p. 472, ℓ. 5; p. 472, ℓ. 46-48). It should be noted that both studies were

accepted by peer-reviewed journals and are often cited by related papers. Accordingly,

given the unpredictability associated with empirical methodology, claiming subject

matter pertaining to empirical methods (and associated means) concretely in the statutory

sense requires more information than is disclosed by Applicant's, even considering those

of ordinary skill in the art. Therefore, upon reviewing Applicant's Claims and

specification, the Applicant's claimed method and associated system lacks concreteness,

a judicially established requirement of 35 U.S.C. 101.

23.     Further discussion of concreteness with respect to the corresponding enablement

requirement of 35 U.S.C. 112, first paragraph, is set forth below beginning at Paragraph

29.


24.     Addressing now the lack of tangibility, Claims 1-10 fail to recite any limitations

producing a tangible result. Generally, Applicant's claims are directed to a statistical

and, therefore, inherently mathematical method. The mere presence of a mathematical

algorithm is not being asserted as a reason for intangibility. Instead, the claimed

limitations as a whole are found to be directed to nothing more than abstract, intangible

ideas. Diehr at 9.

25.     Upon a review of the step limitations within the claims, the step of "quantifying a relationship" at line 17 of Claim 1 ("Step 270") appears to have been intended as the primary and tangible output of Applicant's method.  However, Applicant's specification defines this step to be fitting the model specified a priori by a research analyst in Step 230 to the prescription data (Applicant's specification at p. 8, ℓ. 17-19).  At page 3, lines 23-24, the specification reads that "the relationship between the promotions and product performance is quantified by taking into account the selected functional forms." Moreover, Applicant notes that an objective of the invention is to "accurately measure the incremental prescriptions attributable to promotions" (Applicant's specification at p. 9, ℓ. 10-11).

26.     The concept of "fit" within the art of statistics or mathematics is often applied within the context of using a regression method (e.g. ordinary least squares) to estimate the equation of a best-fit line ( "line of best fit," The Penguin Dictionary of Mathematics, Penguin Books Ltd, 1989, 1998).  In particular, the output of such an operation is generally an equation (or set of equations) including coefficients and/or errors (e.g. Wichern, Dean W. and Richard H. Jones, "Assessing the Impact of Market Disturbances Using Intervention Analysis," Management Science," Nov 1977, Vol. 24, No. 3, 329-337, herein "Wichern," at p. 333, ℓ. 19-28 and at Table 1).  Thus, Applicant's step of "quantify a relationship" is interpreted as producing such an equation or equations, in accordance with the ordinary and customary meaning of "fit" in the art of time-series data analysis.  However, to usefully "quantify" the relationship, the equations (or associated coefficients and errors) must undergo further mathematical and/or subjective evaluation (Wichern at p. 334, ℓ. 3 – p. 336, ℓ. 2) to produce a tangible result.  Applicant's

specification contains no teaching or suggestion to produce any such tangible result (e.g. the incremental product performance attributable to a promotion) beyond the mathematical relationship described above. In contrast, the system in State Street produced a final share price, held to be a practical application of a mathematical algorithm, formula, or calculation. State Street at 1601.

27.     Accordingly, with respect to tangibility, Applicant's method of Claims 1-10 produces, at best, a mathematical relationship in the form of an equation or system of equations. Subsequently, these claims represent no more than a manipulation of basic mathematical constructs, a mathematical algorithm in the abstract. Therefore, Claims 1-10 fail to produce a tangible result, necessitating a rejection under 35 U.S.C. 101. In re Warmerdam, 31 USPQ2d (BNA) 1759 (CAFC 1994).

28.     Applicant's system Claims 11-17 are also rejected under tangibility analysis since these Claims, in reciting limitations corresponding to Claims 1-10, are not directed to tangible subject matter even under a means-plus-function interpretation.


### Claim Rejections - 35 USC § 112

29.     The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

30.     In light of the above rejections under 35 U.S.C. 101, and upon review of the Claims in view of Applicant's specification, Claims 1-17 are further rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. As noted in Paragraph 22, Claims 1-17 fail to meet the concreteness criterion of utility set

forth in State Street. Consequently, the Claims therefore contain subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

31.    The standard for enablement is whether one reasonably skilled in the art could make or use the invention from the disclosures in the patent coupled with information known in the art without undue experimentation. Factors to be considered when determining a lack of enablement and whether necessary experimentation is undue include the breadth of the claims, the nature of the invention, the state of the prior art, the state of the prior art, the level of one of ordinary skill, the level of predictability in the art, the amount of direction provided by the inventor, the existence of working examples, and the quantity of experimentation needed to make or use the invention based on the content of the disclosure. MPEP at §2164.01(a). Upon a review of all of the above factors and the evidence as a whole, sufficient reason exists to support a rejection under the enablement requirement.

32.    Although Applicant attempts to differentiate the claimed method from certain "trial-and-error" prior art methods (Applicant's specification at p. 9, ℓ. 12-20), Applicant's method is inherently "trial-and-error" due to its reliance on Box-Jenkins transfer function methods and other iterative processes disclosed by Applicant. These iterations are either explicitly noted as relying upon the subjective participation of a research analyst or the disclosure is silent with respect to an enabling description of a computer (or algorithmic) implementation of such steps. A detailed discussion of Steps 230-260 is included below.

33.     As discussed above at Paragraph 21, the step of determining a relationship ("Step

230") relies upon the subjective input of a research analyst and implies the necessity of

iterations without satisfactorily specifying the criteria upon which such iterations would

rely beyond simply naming model fitting information, reasonable coefficients, and

robustness.  At least the claimed steps of detecting a lag structure, selecting a functional

form, and evaluating the selected functional form ("Step 240," "Step 250," and "Step

260," respectively) similarly rely upon subjective human input and yield results that vary

significantly depending on such input.

34.     Step 240 includes several sub-steps, Steps 310-360, which are reflected in Claim

8.  Applicant's sole disclosed embodiment of Step 240 relies upon the ARIMA model

fitting approach pioneered by Box-Jenkins at (sub-) at Step 310.  However, as highlighted

by the prior art, the Box-Jenkins model requires iterations (Box 1975 at p. 70, Col. 2, ℓ.

13 – p. 71, Col. 1, ℓ. 4) and is dependent on several subjective decisions on the part of the

researcher (Newbold, Paul, "The Principles of the Box-Jenkins Approach," Operational

Research Quarterly, Jul 1975, Vol. 26, No. 2, Part 2, 397-412, herein "Newbold," at p.

397, ℓ. 13-21), the outcomes of the approach varying greatly, including uninterpretable or

undesirable results (Newbold at p. 398, ℓ. 10-14, 25-32; p. 409, ℓ. 19 – p. 410, ℓ. 39).

Thus, the flexibility provided by the Box-Jenkins Method leads to misuse even by those

skilled in the art of time-series data analysis (Newbold at p. 411, ℓ. 27-33).  Further, to

the extent that Claims 1-17 read on Helmer et al. (Helmer, Richard M. and Johny K.

Johansson, "An Exposition of the Box-Jenkins Transfer Function Analysis With an

Application to the Advertising-Sales Relationship," Journal of Marketing Research, May

1977, Vol. 14, 227-239, herein "Helmer"), discussed in detail starting at Paragraph 69,

Applicant's claims lack enablement since many of the model choices are resolved "on

fairly ambiguous bases" and are "a matter of art" (Helmer at p. 230, ℓ. 36-50).

35.     Step 250 includes (sub-) Steps 410 and 420, corresponding to the steps of plotting

pharmaceutical sales and selecting the functional form recited in Claim 9.  As described

in the specification at page 7, line 14 – page 8, line 12, the method distinguishes either

between a gradual change of slope (M(t) at Eqn. 3) or an abrupt jump (M(t) at Eqn. 4).

However, if the market event under consideration "which may impact" product

performance does not result in either of these visible effects on product performance data,

then Applicant's method fails at this step to take into account the market event (see

previous discussion at Paragraph 20).  On the other hand, the teaching of Step 250 may

have been intended to limit the type of market event detectable by a research analyst in

Step 210 or the method in which the research analyst might detect such market events.  In

either case, clarification is required to provide enabling disclosure of Step 250.

36.     In addition to Steps 230-250, the step of evaluating the selected functional form

("Step 260") also lacks concreteness/enablement for the same reasons as those set forth

regarding Step 240.  Step 260 is described by Applicant as accomplished using the steps

of Step 240 (Applicant's specification at p. 8, ℓ.15).

37.     Lastly, the recitation of "one more market events" in the claims may lack

enablement in view of the prior art.  In particular, Shao provides a method based on Box-

Jenkins transfer function and intervention analyses for estimating the impact of multiple

marketing strategy events (Shao, Y. Eric, "Multiple Intervention Analysis with

Application to Sales Promotion Data," Journal of Applied Statistics, 1997, Vol. 24, No. 2,

181-191).  However, the inclusion of fifteen interventions (corresponding substantially to

Applicant's M(t), "one or more functional forms") introduced serious problems in

estimating model parameters (Shao at p. 185, ℓ. 39-45). Reducing the number of

interventions to five by grouping alleviated the noted problem.

38.     Therefore, the evidence of record as a whole supports the prima facie rejection of

Claims 1-17 as failing to comply with the enablement requirement.


39.     The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly
> claiming the subject matter which the applicant regards as his invention.

40.     Claims 1-17 are rejected under 35 U.S.C. 112, second paragraph, as being

indefinite for failing to particularly point out and distinctly claim the subject matter

which applicant regards as the invention.

41.     In particular, Claims 1, 11, 15, and 17 recite limitations with insufficient

antecedent basis. Independent Claims 1 and 11 recite "the impact of one or more

promotions" in their preambles. Claim 15 recites "said one or more pharmaceutical

market events" at line 3. Claim 17 recites "said plotted data" at line 6.

42.     Additionally, Claims 1-2, 4, 7, 8, and 11-12 recite limitations rendering the scope

of the claims indefinite in view of Applicant's disclosure.

43.     Claims 1 and 11 recite "market events which may impact said product

performance." It is unclear whether or not impacting product performance is actually

required by the Claims. For the purpose of expediting examination, the impact limitation

is interpreted as optional and non-limiting.

44.     Claims 2 and 12 recite "between said one or more promotions, said product

performance, and said evaluated selected functional forms." It is unclear between which

of the recited features multicollinearity problems are to be checked. For the purpose of expediting examination, the "between" limitation is interpreted to include any pair-wise combination of the individual members of the one or more promotions, the product performance, and evaluated selected functional forms.

45.      Claim 4 recites "said quantified relationship" although "a relationship" is recited at lines 8 and 17 of base Claim 1. It is unclear to which earlier recitation of "a relationship," if any, this limitation is intended to refer.

46.      Claim 7 recites a Markush group "the group consisting of multiplicative, additive, or other." However, "or other" renders the claim indefinite because the claim includes elements not actually disclosed (those encompassed by "other"), thereby rendering the scope of the claim unascertainable. It is unclear whether the claimed narrower range (the Markush group) is a limitation. MPEP at §§2173.02 - 2175.05. For the purpose of expediting examination, "other" is interpreted to be inclusive of any relationship not included in either multiplicative or additive.

47.      Claim 8 recites "one or more appropriate functional form" at line 13 although Claim 1 recites "one or more functional forms," "said selected functional forms," and "said evaluated selected forms." For the purpose of expediting examination, "one or more appropriate functional form" in Claim 8 is interpreted as standing alone.

48.      Claim 1 recites "if one or more abnormal events are detected, generating a description for each detected abnormal event." Claim 6 also recites "if one or more abnormal events are detected, generating statistical descriptions for each detected abnormal event." Likewise, Claim 11 recites "means for examining said predetermined one or more market events to detect any abnormal event and for generating a description

for each detected abnormal event, if any." It is unclear whether or not generating a description is required by these Claims. For instance, for clean data sets or data sets in which no abnormal events are detected, these limitations would not apply. For the purpose of expediting examination, the step of generating and means for generating are interpreted as optional and non-limiting in the event that an abnormal event is not detected.

49.     In a related issue, the term "abnormal" in Claims 1, 6, and 11 is a relative term that renders the claim indefinite. The term "abnormal" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably informed of the scope of the invention. Especially in light of Applicant's area of invention, statistical analysis to investigate and model relationships within data, determination of an "abnormal event" is highly subjective since such "abnormality" might be reflective of a trend or event that a research analyst intends to assess. Although the specification makes suggestion that the cause of an abnormal event might be human error, it does not provide a description of how such abnormality would be detected. Thus, for the purpose of expediting examination, "abnormal" is interpreted as non-limiting.

### Claim Rejections - 35 USC § 102

50.     The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

51.    Given the breadth of Applicant's proposed claims and the range of ordinary and

customary meanings afforded the limitations within the relevant art, the following

rejections are intended to illustrate several reasonable variations on claim interpretation,

where the claims are afforded their broadest reasonable interpretation. Springs Window

Fashions L.P. v. Novo Industries L.P., 65 USPQ2d (BNA) 1826, 1830 (CAFC 2003).


52.    Claims 1, 3-7, and 9-10 are rejected under 35 U.S.C. 102(b) as being anticipated

by Basara (Basara, Lisa Ruby, "The Impact of a Direct-To-Consumer Prescription

Medication Advertising Campaign on New Prescription Volume," Drug Information

Journal, 1996, Vol. 30, 715-729).

53.    In applying Basara, a market event is interpreted to include one or more

promotions in accordance with the common art definitions of the recited limitations.

Such interpretation is wholly consistent with Basara and Applicant's specification. In

Basara, a market event (DTCA campaign) inherently includes one or more promotions

(advertisements) in magazines, newspapers, and on television (Basara at p. 716, Col. 1, ℓ.

47 – Col. 2, ℓ. 24). Correspondingly, Applicant provides several examples of a "market

event" including "other market inputs," "other market events," and "other variables"

(Applicant's specification at p. 5, ℓ. 17; p. 4, ℓ. 26; p. 9, ℓ. 14; and p. 8, ℓ. 13-16).

However, Applicant's disclosure leaves unclear in which instances a market event is

definitely separate from a promotion or how a distinction between the two limitations is

made (e.g. by a research analyst). For instance, the entry of a competitive product is

generally accomplished or communicated to the public using a promotional campaign.

Alternatively, price and product attributes (and changes related thereto) are also strongly associated with promotions. Other well-known examples of such market events include a company's communication of newly approved indications for its product, a company-issued press release (as it is well known in the art to use a press release as a promotional vehicle), and publicity from a source outside of a company (such as a newspaper review). Especially given the time-series data analyzed by Applicant's method, a patentably consistent dichotomy (if at all intended) between promotions and market events is ambiguous, thereby necessitating the above varying interpretations.

54.     With regard to Applicants' Claim 1, Basara teaches a method including steps of determining one or more market events (Basara at p. 719, Col. 1, ℓ. 6 – Col. 2, ℓ. 36), examining said determined one or more market events to detect an abnormal event (Basara at p. 719, Col. 2, ℓ. 39 – p. 720, Col. 2, ℓ. 47), determining a relationship ("an increase") between each of the one or more promotions and the product (Basara at p. 721, Col. 1, ℓ. 14-46), systematically detecting a promotion lag structure between the one or more promotions and the product performance for the product (Basara at p. 721, Col. 1, ℓ. 48 – p. 723, Col. 2, ℓ. 6), selecting one or more functional forms to account for an impact of each of the one or more determined market events which may impact the product performance (Basara at p. 722, Col. 1, ℓ. 36 – p. 723, Col. 1, ℓ. 12), evaluating each of the selected functional forms to account for the one or more determined market events (Basara at p. 723, Col. 1, ℓ. 13 – Col. 2, ℓ. 6), and quantifying a relationship between the one or more promotions and the product performance for the product by taking into account the evaluated selected functional forms (Basara at p. 723, Col. 2, ℓ. 9 – p. 725, Col. 1, ℓ. 28; Table 2).

55.     Basara also discloses that the relationship between one or more promotions and

product performance includes a quantified portion and a residual portion, and evaluating

the residual portion to detect auto-correlation (Basara at p. 721, Col. 2, ℓ. 39 – p. 722,

Col. 1, ℓ. 34).  Additionally, Basara further discloses evaluating and validating a

quantified relationship (Basara at p. 725, Col. 2, ℓ. 1 – p. 728, Col. 1, ℓ. 4), a

pharmaceutical product, and manually determining one or more pharmaceutical market

events that may impact pharmaceutical product performance (Basara at p. 719, Col. 1, ℓ.

6 – Col. 2, ℓ. 36), thereby anticipating the limitations of Claim 3-5.

56.     Turning now to Claims 6-7, Basara teaches statistically determining whether any

of said one or more pharmaceutical market events is an abnormal event, and generating

statistical descriptions for each detected abnormal event (Basara at p. 719, Col. 2, ℓ. 39 –

p. 720, Col. 2, ℓ. 47), and determining a relationship between each of the one or more

promotions and the product to be a relationship selected from the group consisting of

multiplicative, additive, or other (Basara at p. 721, Col. 1, ℓ. 14-46).

57.     Claims 9 and 10 are also anticipated by Basara.  Specifically, Basara teaches the

step of selecting a functional form to include plotting sales versus time (Basara at p. 718,

ℓ. 10-18) and selecting a functional form (Basara at p. 722, Col. 1, ℓ. 36 – p. 723, Col. 1,

ℓ. 12), as well as the step of evaluating the functional form to including graphical

evaluation (Basara at Figure 1).


58.     Alternatively, Claims 1, 3-7, and 9-10 are rejected under 35 U.S.C. 102(b) as

being anticipated by Box 1975.  Although the specific examples described within Box

1975 relate to smog data and the consumer price index, Box 1975 states that the disclosed

techniques also apply to investigating the possible effect of promotions, advertising

campaigns, and price changes on the sale of a product (Box 1975 at p. 70, Col. 1, ℓ. 30-

32).

59.     Box 1975 teaches all limitations recited in Applicant's Claim 1, including steps of

determining one or more market events (Box 1975 at p. 70, Col. 1, ℓ. 10-32; Figure A),

examining the determined one or more market events to detect an abnormal event (Box

1975 at p. 76, Col. 1, ℓ. 23-25), determining a relationship between each of one or more

promotions and a product (Box 1975 at p. 71, Col. 1, ℓ. 32 – Col. 2, ℓ. 2), detecting a

promotion lag structure between one or more promotions and product performance (Box

1975 at p. 73, Col. 2, ℓ. 4-18), selecting one or more functional forms to account for the

impact of each of the one or more determined market events (Box 1975 at p. 71, Col. 2, ℓ.

4 – p. 72, Col. 2, ℓ. 35; p. 73, Col. 2, ℓ. 19-45), evaluating each of the selected functional

forms to account for the one or more determined market events (Box 1975 at p. 73, Col.

2, ℓ. 19-45), and quantifying a relationship between the one or more promotions and

product performance by taking into account the evaluated functional forms (Box 1975 at

p. 73, Col. 2, ℓ. 46 – p. 74, Col. 1, ℓ. 15).

60.     In applying Box 1975, the noise figure, $N_t$, represents the lagged relationship of

promotions on product performance where those promotions are different from the

market events represented by the intervention terms, $\xi_{tj}$. $N_t$, in effect, is a catchall

function taking into account the impact on product performance of all factors other than

the explicitly specified market events. As described in the reference, fitting the model

can make it possible to evaluate the explanatory potential of the noise figure (and

therefore the promotion impact) with respect to product performance (Box 1975 at p. 71,

Col. 2, $\ell$. 32-36). Alternatively, the market event/intervention terms, $\xi_{tj}$, of Box 1975 can

also include one or more promotions, such as several months of advertising expenditure

for a single campaign (Box 1975 at p. 72, Col. 2, $\ell$. 32-36; see also Wichern at p. 332, $\ell$.

1-2) since the reference provides teaching that, generally, $\xi_{tj}$ can be an exogenous time

series (Box 1975 at p. 71, Col. 2, $\ell$. 25-26). Such an application would leave the noise

term to account for market events or, as in Basara, the series of promotions could

constitute the market event. Accordingly, the general model set forth by Box 1975

accommodates both interpretations of market events in relation to promotions: (1) a

market event being separate from a studied promotion; or (2) a market event including at

least one promotion. For an examples of interpretation (1), rejections based on Leone

1987 and Helmer are detailed beginning at Paragraphs 64 and 69, respectively.

61.     Box 1975 also anticipates the limitations of Claim 3, including a relationship

between the one or more promotions and product performance including a quantified

portion and a residual portion, and a step of evaluating the residual portion to detect auto-

correlation (Box 1975 at p. 73, Col. 2, $\ell$. 10-16; p. 74, Col. 2, $\ell$. 16). The quantified and

residual portions are inherently taught by the use of transfer function analysis in Box

1975. Additionally, Box 1975 describes a step of evaluating and validating the quantified

relationship (Box 1975 at p. 74, Col. 1, $\ell$. 16-21), limitations recited in Applicant's Claim

4.

62.     With regard to Claim 5, although Box 1975 does not specifically teach a method

applied to a pharmaceutical product, Box 1975 applies to pharmaceutical products by

teaching, in general, analyzing sales with respect to promotions, price changes, and other

events. Moreover, the pharmaceutical limitations in the claims amount to "limiting use"

language. However, Applicant provides no explicit or implied reason for distinguishing the analysis of pharmaceutical products from other products. In the absence of evidence supporting such a distinction and given the general applicability of Box-Jenkins transfer function/intervention analysis to many types of time series data (Basara and Applicant's specification at p. 4, ℓ. 22-24), the "pharmaceutical" limitations are not afforded patentable weight. MPEP at §2106(II). Further, the market event determining step of Box 1975 also includes manual determination of one or more market events (Box 1975 at p. 70, Col. 1, ℓ. 10-32; Figure A).

63.    Box 1975 also includes the abnormality examining step limitations of Claim 6 (Box 1975 at p. 76, Col. 1, ℓ. 13-25) and the relationship determining step limitations of Claim 7 (Box 1975 at p. 71, Col. 1, ℓ. 32 – Col. 2, ℓ. 2). Applicant's steps of plotting and selecting in Claim 9 read on the reference (Box 1975 at Figure A; p. 71, Col. 2, ℓ. 47-49; p. 73, Col. 2, ℓ. 19-45), and Claim 10 reads on Box 1975 at least at Figure B.


64.    In another alternative application of prior art, Claims 1, 3-5, and 9-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Leone 1987.

65.    All limitations of Claim 1 read on the method taught by Leone 1987. Specifically, Leone 1987 discloses steps of determining one or more market events and examining the determined one or more market events to detect an abnormal event (Leone 1987 at p. 463, ℓ. 5-8; p. 464, ℓ. 1-21), determining a relationship between each of one or more promotions and a product (Leone 1987 at p. 465, ℓ. 1-10), detecting a promotion lag structure between one or more promotions and product performance (Leone 1987 at p. 465, ℓ. 11 – p. 466, ℓ. 6), selecting one or more functional forms to account for the

impact of each of the one or more determined market events (Leone 1987 at p. 466, ℓ. 7 –

p. 467, ℓ. 3), evaluating each of the selected functional forms to account for the one or

more determined market events (Leone 1987 at p. 467, ℓ. 3-5; p. 472, ℓ. 20-41), and

quantifying a relationship between the one or more promotions and product performance

by taking into account the evaluated functional forms (Leone 1987 at Table 1).

66.     In applying Leone 1987, $N_t$ represents the identified and evaluated promotion lag

structure.  As discussed in the reference, the $N_t$ noise model is very flexible and able to

contain multiplicative, seasonal, autoregressive, moving average, and difference terms to

accurately reflect the behavior of the system beyond of the explanations provided by the

other terms comprising $y_t$, $(\omega(B)/\delta(B))\xi_t$, which reflect the impact of predetermined

market events (Leone 1987 at p. 465, ℓ. 1-39).

67.     Following from the use of the Box-Jenkins method, the relationship between the

one or more promotions and product performance in Leone 1987 inherently includes a

quantified portion and a residual portion (Leone 1987 at p. 465, ℓ. 1-10), and Fig. 1 of

Leone 1987 teaches a step of evaluating the residual portion to detect auto-correlation,

thereby anticipating Claim 3.  Relating to Claim 4, the reference teaches a step of

evaluating and validating the quantified relationship (Leone 1987 at p. 472, ℓ. 37-41; p.

473, ℓ. 18-23).

68.     In a similar manner as Box 1975, Leone 1987 provides a method relating to

pharmaceuticals where the market event determining step includes manually determining

one or more pharmaceutical market events (Leone 1987 at p. 463, ℓ. 5-8; p. 464, ℓ. 1-8),

thereby anticipating Claim 5.  Furthermore, Figs. 6 and 5 of Leone 1987 anticipate

Claims 9 and 10, respectively (Leone 1987 at p. 472, ℓ. 3-5, 20-26).

69.    In yet another alternative, Claims 1-5 and 8 are rejected under 35 U.S.C. 102(b) as

being anticipated by Helmer.

70.    Helmer teaches Applicant's method as recited in Claim 1, including determining

one or more market events (Helmer at p. 230, Col. 1, ℓ. 47 – Col. 2, ℓ. 13), examining the

determined one or more market events to detect an abnormal event (Helmer at p. 233,

Col. 2, ℓ. 16-22), determining a relationship between each of the one or more promotions

and the product (Helmer at Fig. 2 (1); p. 229, Col. 2, ℓ. 8-14; p. 231, Col. 1, ℓ. 3-19),

systematically detecting a promotion lag structure between the one or more promotions

and the product performance for the product (Helmer at Fig. 2(2)-(6); p. 229, Col. 2, ℓ. 15

– p. 230, Col. 1, ℓ. 46; p. 231, Col. 1, ℓ. 21 – p. 233, Col. 2, ℓ. 5), selecting one or more

functional forms to account for any impact of each of the one or more determined market

events which may impact product performance (Helmer at Fig. 2(7); p. 230, Col. 1, ℓ. 47

– Col. 2, ℓ. 13; p. 233, Col. 2, ℓ. 7-32), evaluating each of the selected functional forms to

account for the one or more determined market events (Helmer at Fig. 2(7); p. 230, Col.

1, ℓ. 47 – Col. 2, ℓ. 13; p. 233, Col. 2, ℓ. 33 – p. 234, Col. 1, ℓ. 24), and quantifying a

relationship between the one or more promotions and product performance for the

product by taking into account the evaluated selected functional forms (Helmer at Fig.

2(8); p. 230, Col. 2, ℓ. 13-19; p. 234, Col. 1, ℓ. 25 – Col. 2, ℓ. 14).

71.    In contrast to the interpretation applied using Box 1975, $N_t$ in Helmer is taken to

represent the impact of one or more market events other than the promotions. As

described in Helmer, the effects of situational and other unspecified factors are

characterized as "noise" or "shocks." $N_t$ represents the composite effect of these factors.

Situational and other unspecified factors in <u>Helmer</u> include all factors other than the

impact of promotions on sales, which is modeled and quantified by <u>Helmer</u>'s Steps 1-6.

Therefore, by separately characterizing the noise, the incremental impact of promotions

on performance can be measured.

72.    The "second diagnostic check" of <u>Helmer</u> further discloses checking for

multicollinearity problems, a limitation recited in Applicant's Claim 2, by detecting

cross-correlation between the independent variable and the residuals, which are

themselves a function of the independent variable (<u>Helmer</u> at p. 234, Col. 2, $\ell$. 29 – p.

235, Col. 1, $\ell$. 5). <u>Helmer</u> also describes a relationship between the one or more

promotions and product performance including a quantified portion and a residual

portion, as well as evaluating the residual portion to detect auto-correlation (<u>Helmer</u> at p.

228, Col. 1, $\ell$. 24 – Col. 2, $\ell$. 23; p. 234, Col. 2, $\ell$. 16-28), limitations recited in Claim 3.

Concerning Applicant's Claim 4, <u>Helmer</u> forecasting ability analysis teaches steps of

evaluating and validating a quantified relationship (<u>Helmer</u> at p. 235, Col. 2, $\ell$. 3-13;

Table 7).

73.    Likewise, <u>Helmer</u> teaches the limitations of Claim 5. <u>Helmer</u>'s general teaching

of a method for modeling the relationship between advertising (promotion and/or market

event) and sales (product performance) encompasses Applicant's claimed pharmaceutical

product, pharmaceutical market events, and pharmaceutical product performance for

reasons motivated above at Paragraph 62. Along the same lines, <u>Helmer</u> also provides a

general teaching of determining one or market events including a manual determination

of such events.

74.    With regard to Claim 8, <u>Helmer</u> teaches fitting a univariate auto-regressive model

to each of the one or more promotions to determine one or more promotion residual

series (<u>Helmer</u> at Fig. 2(2); p. 231, Col. 2, ℓ. 4-14), regressing performance information

for the product to determine a product residual (<u>Helmer</u> at Fig. 2(3)), transforming the

product residual into a product residual series (<u>Helmer</u> at Fig. 2(4); p. 231, Col. 2, ℓ. 43 –

p. 232, Col. 1, ℓ. 2), determining one or more cross-correlation functions between the one

or more promotion residual series and the product residual series (<u>Helmer</u> at Fig. 2(5); p.

232, Col. 1, ℓ. 4 – Col. 2, ℓ. 5), plotting the one or more cross-correlation functions to

detect any lagged effect from the one or more promotions corresponding to the one or

more cross-correlation functions (<u>Helmer</u> at Fig. 4), and selecting one or more

appropriate functional forms which best fits the plotted functions (<u>Helmer</u> at Fig. 2(6);

Eqns. 14-15).


## *Claim Rejections - 35 USC § 103*

75.    The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

76.    In addition to the discussion at Paragraphs 52-57 and 69-74 rejecting Claims 1-10

under 35 U.S.C. § 102(b) as anticipated by either <u>Basara</u> or <u>Helmer</u>, Claims 1-10 are

alternately rejected under 35 U.S.C. 103(a) as being unpatentable over <u>Helmer</u> in view of

<u>Basara</u>.

77.    The methods of Helmer and Basara can be combined to provide a model capable

of more accurately identifying the effects of promotions on product performance by

further specifying the effect of a market event. Regardless of whether a predetermined

market event includes a promotion, the combination of methods taught by Helmer and

Basara specifies a model including terms accounting for the impact of a promotion (or

series of promotions) and terms accounting for the impact of a market event distinct from

the previously mentioned promotion (or promotions). Generally, Helmer's techniques for

identifying and modeling the impact of promotions are combined with Basara's

intervention analysis approach for taking into account the effects of a discrete market

event.

78.    More specifically, with regard to Claim 1, the combination relies upon Helmer to

teach the steps of determining a relationship between each of the one or more promotions

and the product, and systematically detecting a promotion lag structure between the one

or more promotions and the product performance for the product. Basara is relied upon

to teach the steps of determining one or more market events, examining said determined

one or more market events to detect an abnormal event, selecting one or more functional

forms to account for an impact of each of the one or more determined market events

which may impact the product performance, and evaluating each of the selected

functional forms to account for the one or more determined market events. Helmer is

also applied to teach the step of quantifying a relationship between the one or more

promotions and the product performance for the product by taking into account the

evaluated selected functional forms. Relevant portions of Helmer and Basara with

respect to each anticipated step correspond to those cited in the original rejections under

35 U.S.C. 102(b).

79.    Instead of relying only upon Helmer's noise term, $N_t$, to account for unspecified

factors including the effects of a market event (described at Paragraph 71, Basara's

intervention analysis, (e.g. a term similar to $[\omega(B)B^b/\delta(B)]I_t$), is incorporated into

Helmer's method to explicitly specify the effect of a predetermined market event, thereby

improving the specification and explanatory/predictive power of Helmer's model.

80.    With regard to the compatibility of the Helmer and Basara methods, it is noted

that both are directed to time-series analysis involving Box Jenkins transfer function

analysis for advertising data. Furthermore, intervention analysis is merely an extension

of univariate transfer function analysis (Box 1975; Leone 1987 at p. 464, $\ell$. 41). As such,

intervention analysis is readily combinable with transfer function models. For instance,

Hanssens (Hanssens, Dominique M., "Market Response, Competitive Behavior, and

Time Series Analysis," Journal of Marketing Research, Nov 1980, Vol. 17, 470-85)

provides univariate Box-Jenkins and intervention models to account for the potential

effects of strikes when estimating the primary demand effects of marketing mix variables

(Hanssens at p. 477, Col. 2, $\ell$. 1-53; Table 2).

81.    Having established the compatibility of the two methods, one of ordinary skill in

the art at the time of Applicant's invention would look to combine the teachings of

Helmer and Basara to provide a more fully specified model, where econometric model

specification is a fundamental factor in the explanatory and predictive effectiveness. In

econometrics, models are typically misspecified because of omitted variables (Leone,

Robert P., "Modeling Sales-Advertising Relationships: An Integrated Time Series-

Econometric Approach," Journal of Marketing Research, Vol. 20, Aug 1983, 291-295, at

p. 292, Col. 1, ℓ. 32-35). Thus, it would have been obvious to one skilled in the art of

time-series data analysis at the time of Applicant's invention to combine the methods of

Helmer and Basara to enhance the specification of Helmer's model, thereby increasing

the explanatory and predictive power of the model.

82.     The remaining limitations of Claims 2-4 and 8 are taught by Helmer, and the

remaining limitations of Claims 5-7 and 9-10 are taught by Basara. Detailed discussion

of these rejections are located at least at Paragraphs 52-57 and 69-74 above.


83.     Addressing now Claim 2, in addition to the teachings of Helmer described at

Paragraph 72, this Claim is rejected under 35 U.S.C. 103(a) as being unpatentable over

any one of Basara, Box 1975, and Leone 1987 in view of Grapentine (Grapentine, Terry,

"Managing Multicollinearity," Marketing Research, Fall 1997, Vol. 9, No. 3, 10-21).

The primary references are silent with regard to an explicit step of detecting

multicollinearity problems. As described by Grapentine, detection of and correction for

multicollinearity is a well known issue in econometric analysis involving a relationship

between multiple independent variables, where multicollinearity can lead to falsely

insignificant estimates or coefficients with incorrect signs (Grapentine at p. 11, Col. 1, ℓ.

13-16). Each of Basara, Box 1975, and Leone 1987 involves multiple independent

variables such as time series inputs and intervention terms. Therefore, it would have

been obvious to one skilled in the art at the time of Applicant's invention to modify any

one of Basara, Box 1975, and Leone 1987 to include a check for multicollinearity

problems to improve the accuracy of a time-series/econometric model.

84.    Claims 6-7 are alternately rejected under 35 U.S.C. 103(a) as unpatentable over

<u>Leone 1987</u> in view of <u>Hillmer</u> (Hillmer, Steven, "Monitoring and Adjusting Forecasts in

the Presence of Additive Outliers," Journal of Forecasting, Apr-Jun 1984, Vol. 3, No. 2,

205-215).  As discussed at Paragraph 65 above, <u>Leone 1987</u> teaches all limitations of

base Claim 1 and intervening Claim 5.  However, <u>Leone 1987</u> does not explicitly

describe the limitations recited in Claims 6-7.

85.    <u>Hillmer</u> remedies the deficiencies of <u>Leone 1987</u> with respect to Claims 6.

Specifically, <u>Hillmer</u> teaches an abnormality examining step including statistically

determining whether any of said one or more pharmaceutical market events is an

abnormal event and, if one or more abnormal events are detected, generating statistical

descriptions for each detected abnormal event (<u>Hillmer</u> at p. 205, $\ell$. 1-5; p. 210, $\ell$. 13 – p.

211, $\ell$. 2).  Concerning Claim 7, <u>Leone 1987</u> teaches a relationship between each of the

one or more promotions and the product to be a relationship selected from the group

consisting of multiplicative, additive, or other (<u>Leone 1987</u> at p. 464, $\ell$. 9-21).

86.    <u>Hillmer</u> is generally directed to methods for adjusting for and detecting additive

outliers (non-typical observations) in statistical forecasting, since outliers will negatively

affect forecast effectiveness (<u>Hillmer</u> at Abstract).  Thus, motivated to improve the

forecasting ability of the models set forth in <u>Leone 1987</u>, it would have been obvious to

one skilled in the art at the time of Applicant's invention to modify <u>Leone 1987</u> to

include a step of statistically determining if an event is abnormal as taught by <u>Hillmer</u>.

87.     Claim 8 is alternately rejected under 35 U.S.C. 103(a) as being unpatentable over

Leone 1987 in view of Hooley et al. (Hooley, G. J., N. Wilson, and P. Wigodsky,

"Modeling the Effects of Advertising: Some Methodological Issues," Journal of the

Market Research Society, Jan 1988, Vol. 30, Iss. 1, 45-58, herein "Hooley"). As noted

previously, Leone 1987 teaches all limitations of base Claim 1. However, Leone 1987

does not explicitly describe the limitations recited in Claim 8.

88.     Hooley remedies the deficiencies of Leone 1987 with respect to Claim 8. In

particular, Hooley provides a method of systematically detecting a promotion lag

structure including steps of fitting a univariate auto-regressive model to each of the one

or more promotions to determine one or more promotion residual series (Hooley at p. 52,

ℓ. 24-27; Figure 1), regressing performance information for the product to determine a

product residual and transforming the product residual into a product residual series

(Hooley at p. 52, ℓ. 27-32; Figure 1), determining one or more cross-correlation functions

between the one or more promotion residual series and the product residual series

(Hooley at p. 52, ℓ. 33-35), plotting the one or more cross-correlation functions to detect

any lagged effect from the one or more promotions corresponding to the one or more

cross-correlation functions (Hooley at Table 1), and selecting one or more appropriate

functional forms which best fits the plotted functions (Hooley at p. 52, ℓ. 35-42).

89.     Generally, Hooley provides an illustration of how Box Jenkins methodology can

be applied to identify and include the influence of variables other than advertising prior to

econometric modeling (Hooley at Abstract).   The ARIMA modeling and cross-

correlation techniques described by Hooley advantageously provide a better model than

the conventional econometric model (Hooley at p. 57, ℓ. 1-16). Thus, motivated by the

enhanced predictive and explanatory power of <u>Hooley</u>'s approach, it would have been

obvious to one skilled in the art at the time of Applicant's invention to modify <u>Leone</u>

<u>1987</u>'s step of detecting promotion lag by applying <u>Hooley</u>'s method.

90.     Claim 8, rejected as anticipated by <u>Helmer</u>, is alternately rejected under 35 U.S.C.

103(a) as being unpatentable over <u>Box 1975</u> in view of <u>Haugh et al</u>. (Haugh, Larry D.

and G.E.P. Box, "Identification of Dynamic Regression (Distributed Lag) Models

Connecting Two Time Series," Journal of the American Statistical Association, March

1977, Vol. 72, No. 357, 121-130, herein "<u>Haugh</u>").

91.     As described above at Paragraph 58, <u>Box 1975</u> teaches all limitations of base

Claim 1.  However, <u>Box 1975</u> does not explicitly disclose all limitations of Claim 8.

<u>Haugh</u> remedies these deficiencies.  Specifically, <u>Haugh</u> provides a method for

systematically detecting a promotion lag structure including steps of fitting a univariate

auto-regressive model to each of the one or more promotions to determine one or more

promotion residual series (<u>Haugh</u> at p. 127, Col. 1, $\ell$. 7-9), regressing performance

information for the product to determine a product residual and transforming the product

residual into a product residual series (<u>Haugh</u> at p. 127, Col. 1, $\ell$. 1-4; p. 123, Col. 1, $\ell$.

45-52), determining one or more cross-correlation functions between the one or more

promotion residual series and the product residual series (<u>Haugh</u> at p. 127, Col. 1, $\ell$. 11-

13), plotting the one or more cross-correlation functions to detect any lagged effect from

the one or more promotions corresponding to the one or more cross-correlation functions

(<u>Haugh</u> at Figure A), and selecting one or more appropriate functional forms which best

fits the plotted functions (<u>Haugh</u> at Eqn. 4.3).  It is also noted that <u>Haugh</u> provides a brief

comparison of the disclosed method with the cross-correlation method of the Box 1976

text cited by Applicant (Haugh at p. 129, Col. 2, ℓ. 57 – p. 130, Col. 1, ℓ. 10).

92.    Generally, Haugh is directed to methods for identifying distributed lag models

relating two time series intended to improve upon current identification methods (Haugh

at Abstract; p. 129, Col. 2, ℓ. 17-20). Thus, motivated to improve the detection of the lag

structure described in Box 1975, one skilled in the art at the time of Applicant's invention

would have found it obvious to modify the step of systematically detecting promotion lag

in Box 1975 by applying Haugh's cross-correlation method.


93.    Addressing now Applicant's System Claims 11-17, these Claims are further

rejected under 35 U.S.C. 103(a) as being unpatentable over either one of Basara, Box

1975, and Leone 1987 or Helmer in view of Didow et al. (Didow, Jr., Nicholas M. and

George R. Franke, "Measurement Issues in Time-Series Research: Reliability and

Validity Assessment in Modeling the Macroeconomic Effects of Advertising," Journal of

Marketing Research, Vol. 21, Feb 1984, 12-19, herein "Didow"). The primary references

are relied upon for teaching the functional limitations recited in Claims 11-17

(corresponding substantially to Applicant's method Claims 1-5, and 8-9). Specifically,

any one of Basara, Box 1975, and Leone 1987 teaches method limitations corresponding

to Claims 11, 13-15, and 17, while Helmer teaches method limitations corresponding to

Claims 12 and 16.

94.    Moreover, in accordance with 35 U.S.C. § 112, sixth paragraph, the means-plus-

function limitations of Claims 11-17 are interpreted to include a system including a

computer executing standard off-the-shelf statistical software, a research analyst

performing Applicant's claimed method manually, and equivalents thereof (Applicant's specification at least at p. 5, ℓ. 8-11, 19-20, 30-31; p. 6, ℓ. 21-13; and p. 8, ℓ. 15). As the research analyst/manual interpretation was addressed previously at Paragraph 17 rejecting Claims 11-17 under 35 U.S.C. § 101, the following discussion examines Claims 11-17 in view of the prior art according to the remaining statutory interpretation of these claims, namely a computer executing off-the-shelf statistical software and equivalents thereof.

95.     Basara, Box 1975, Leone 1987, and Helmer do not contain explicit teaching that all functions and steps described therein relating to Applicant's claims are implemented on a computer system running standard statistical software. However, Didow describes the wide availability of computer programs, such as SAS™, for analyzing time series in general. Additionally, Didow notes that such programs would likely spur research of time series in a variety of subjects (Didow at p. 12, Col. 1, ℓ. 11-16).

96.     Therefore, it would have been obvious to one skilled in the art at the time of Applicant's invention to implement the methods described by the primary references on a computer running standard off-the-shelf statistical software such as SAS™ to further contribute to research in the social sciences. Additionally, it is noted that merely providing an automatic means to replace a manual activity which accomplishes the same result is not sufficient to distinguish over the prior art. In re Venner, 262 F.2d 91, 95, 120 USPQ 193, 194 (CCPA 1958).

*Conclusion*

97.     The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure. Hu et al. (Hu, The-Wei, Hai-Yen Sung, and Theodore E. Keeler,

"The State Antismoking Campaign and the Industry Response: The Effects of

Advertising on Cigarette Consumption in California," The American Economic Review,"

May 1995, Vol. 85, No. 2, 85-90) discloses the application of an ARIMA model to

investigate the effects of advertising on cigarette consumption taking into account

exogenous explanatory variables such as state tax, price, and media campaigns. Wiley

("multiple regression," Dictionary of Economics, Wiley, 1995) describes a use of

multiple regression to find the overall association between the dependent variable and a

host of explanatory variables. Liu et al. (Liu, Lon-Mu and Dominique M. Hanssens,

"Identification of Multiple-Input Transfer Function Models," Communications in

Statistics, B11 (1982), 297-314) is directed to a procedure for multiple-input transfer

function identification and includes a comparison to the one-input Box Jenkins

procedure. Haugh (Haugh, Larry D., "Checking the Independence of Two Covariance-

Stationary Time Series: A Univariate Residual Cross-Correlation Approach," Journal of

the American Statistical Association, 1976, Vol. 71, No. 354, 378-385) discloses a

method for investigating the independence of two covariance-stationary time series

related to identifying causality. Huang et al. (US Pat. No. 6,151,582, herein "Huang,"

available as prior art under 35 U.S.C. 102(e)) provides a system including a sales

forecasting and planning module including regression based and Box Jenkins statistical

forecast models.

98.     Lastly, two references cited in the International Search Report PCT/ISA/210 are

noted as material to pending Claims 1-17. Cunningham et al. (U.S. Pat. No. 6,029,139)

discloses a system for optimizing the promotional sale of a product taking into account

competing products including a data structure corresponding to the sales history for a

product. Straub et al. (U.S. Pat. No. 6,035,284) discloses a product rationalization system

and method for determining products that are candidates for deletion from, addition to, or

swapping among inventories.

99.     Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Nicholas Kim whose telephone number is (571) 272-

1392. The examiner can normally be reached on Monday - Friday 8am - 4:30pm.

100.    If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Eric Stamber can be reached on (571) 272-6724. The fax phone number for

the organization where this application or proceeding is assigned is (703) 872-9306.

101.    Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR. Status

information for unpublished applications is available through Private PAIR only. For

more information about the PAIR system, see http://pair-direct.uspto.gov. Should you

have questions on access to the Private PAIR system, contact the Electronic Business

Center (EBC) at 866-217-9197 (toll-free).

NJK

**JEFFREY D. CARLSON**
**PRIMARY EXAMINER**